Date:

14 March 2000

To:

Bechtel Hanford, Inc. (technical representative)

From:

TechLaw, Inc.

Project:

100-D Areas - Full Protocol - 116-D-2 Pluto Crib

Subject: Radiochemistry - Data Package No. H0704-TNU (SDG No. H0704)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0704-TNU which was prepared by Thermo NUtech (TNU). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
вохэј6	1/4/00	Soil	С	See note 1
BOX9J7	1/4/00	Soil	С	See note 1
B0X9J9	1/4/00	Soil	С	See note 1
вох9ко	1/4/00	Soil	С	See note 1
BOX9K1	1/4/00	Soil	С	See note 1
B0X9K2	1/4/00	Soil	С	See note 1

^{1 -} Gamma spectroscopy; alpha spectroscopy (isotopic uranium and isotopic plutonium); total strontium.

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation



DATA QUALITY OBJECTIVES

Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

Blanks

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the MDA, the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable although the PQL for europium-155 and uranium-238(gea) was exceeded.

Equipment Blank

One equipment blank (B0X9J9) was submitted for analysis. Uranium-234, uranium-238(aspec), potassium-40, radium-226, radium-228, thorium-228, thorium-232 were detected in the equipment blank. All other equipment blank results were acceptable.

Accuracy

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery range is either 70-130% or ±3 sigma. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in

associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

All accuracy results were acceptable.

Precision

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than 30 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOX9J6/BOX9J7) were submitted to TNU for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

Detection Levels

Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the contract specified MDA if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The following analytes were reported above their TDL: Uranium-238(gea) and europium-155 in all samples; europium-154 in samples BOX9J6, BOX9J9, BOX9K0 and BOX9K1; americium-241 in sampes BOX9J6, BOX9K0 and BOX9K1; uranium-235 in samples BOX9J6, BOX9K0 and BOX9K1; and plutonium-238 and plutonium-239/240 in sample BOX9K0. Under the BHI statement of work, no qualification is required. All other reported laboratory MDAs were at or below the analyte-specific TDL or contract specified MDA.

Completeness

Data Package No. H0704 (SDG No. H0704) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following analytes were reported above their TDL: Uranium-238(gea) and europium-155 in all samples; europium-154 in samples BOX9J6, BOX9J9, BOX9K0 and BOX9K1; americium-241 in samples BOX9J6, BOX9K0 and BOX9K1; uranium-235 in samples BOX9J6, BOX9K0 and BOX9K1; and plutonium-238 and plutonium-239/240 in sample BOX9K0. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, Validation Statement of Work, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, May 1998.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0704	REVIEWER: TLI	DATE: 3/14/00	PAGE_1_OF_1_						
COMMENTS: No qualifiers assigned									
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON						
		,							

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFOR	30			}													
Laboratory: TNU																	
Case	SDG: H	0704															
Sample Number		B0X316		BOX9J7		B0X9J9		BOX9KO		B0X9K1		BOX9K2					\Box
Location	_	A9		A9		A9		A10		A1		A2					
Remarks				Duplicate		E. Blank						<u> </u>					<u> </u>
Sample Date		01/04/00		01/04/00		01/04/00		01/04/00		01/04/00		01/04/00					L
Radiochemistry	CRDL	Result	a	Result	Q	Result	Q.	Result	a	Result	Q.	Result	0_	Result	Q.	Result	a
Uranium-234	0.1	0.409		0.503	L	0.182		_0.398	L	0.554	<u> </u>	0.419	—		1_	ļ <u>.</u>	
Uranium-235	0.1	0.032	<u>L</u>	0.037	υ	0.009	U	0.012	U	0.048	υ	0.031	U	Ļ	4_	<u> </u>	╄
Uranium-238	0.1	0.411	┖	0.473	_	0.227	<u> </u>	0.466	<u> </u>	0.396	L	0.428			\perp	<u> </u>	╄
Plutonium-238	0.1	-0.007	U	0.004	U	0.004	U	0.054	U	-0.004	U		U_	<u> </u>		<u> </u>	┷
Plutonium-239/40	0.1	-0.007	<u>u</u>	0	U	0.008	U	0	U	-0.007	U	0.019	U	<u> </u>	1_	<u> </u>	丄
Strontium (total)	1	0.060	U	0.017	U.	0.044	U	-0,062	U	-0.063	U	0.018	<u> U </u>	<u> </u>		<u> </u>	
Potassium-40		12.3		12.0		3,09	L	11.8		13.2		11.6	L_	<u> </u>			┸
Cobalt 60	0.05	Ū	u	U	U	U	U	U	U	U	U	U	U_		1_		上
Cesium 137	0.05	0.068		0.044		υ	υ	υ	U	υ	υ	0.057			1_		\perp
Europium 152	0.1	Ū	U	υ	U	υ	U	U	U.	<u> </u>	u	U	U_		丄	<u> </u>	丄
Europium 154	0.1	ū	U	U	υ	U	U	U	U	J	U_	U	U_				丄
Europium 155	0.05	u	\u	U	lυ	U	<u>u</u>	U	u	U	2	U	<u>u</u>	<u> </u>	<u> </u>		
Radium-226		0.526		0.451		0.189	_	0.490	L	0.549		0.435	L_	<u> </u>	$oldsymbol{oldsymbol{oldsymbol{eta}}}$		ᆚ_
Radium-228		0.821		0.683		0.250		0.644	L	0.824		0.738	L_		_		ـــــ
Thorium-228		0.643		0.659	L	0.276	<u> </u>	0.621	_	0.769		0,618	L_	<u> </u>	↓_	<u> </u>	┷
Thorium-232		0.821		0.683		0.250	L	0.644	L	0.824	<u> </u>	0.738			 		
Americium-241 (GEA)	0.1	U	U	U	U		υ	U	U_		U.		U_		╄	L	╄-
Uranium-238 (GEA)	0.1	U	U	U	υ	U	U	<u> </u>	U_	<u> </u>	_		<u> U</u>		↓_		
Uranium-235 (GEA)	0.1	U	υ	U	υ	U	U	<u> </u>	U_	U	υ	U	<u>u</u> _	<u> </u>	4_	<u> </u>	╄-
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DATA SHEET

7330 Melissa C. Mannion	Client/Case no Contract	Hanford TRB-SBB-207925	SDG H0704
	Client sample id Location/Matrix Collected Custody/SAF No	116-D-2 01/04/00 12:30	SOLID 005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.409	0.065	0.017	1.0	<i>J</i> 84	บ
Uranium 235	15117-96-1	0.032	0.016	0.021	1.0	7	ซ
Uranium 238	U-238	0.411	0.065	0.017	1.0	18	ט
Plutonium 238	13981-16-3	-0.007	0.021	0.050	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.007	0.021	0.050	1.0	ט	PÜ
Total Strontium	SR-RAD	0.060	0.12	0.17	1.0	ט	SR
Potassium 40	13966-00-2	12.3	0.80	0.37			MAD
Cobalt 60	10198-40-0	ט		0.040	0.050	ט	GAM
Cesium 137	10045-97-3	0.068	0.038	0.042	0.10	1	GAM
Europium 152	14683-23-9	ט		0.095	0.10	ט	GAM
Europium 154	15585-10-1	ช		0.13_	0.10	ט	GAM
Europium 155	14391-16-3	ប		0.14	0.10	บ	GAM
Radium 226	13982-63-3	0.526	0.081	0.074	0.10		GAM
Radium 228	15262-20-1	0.821	0.17	0.15	0.20		GAM
Thorium 228	14274-82-9	0.643	0.048	0.046			GAM
Thorium 232	TH-232	0.821	0.17	0.15			GAM
Americium 241	14596-10-2	U		0.33		บ	GAM
Uranium 238	U-238	Ū		5.2		U	GAM
Uranium 235	15117-96-1	ซ		0.17		. U	GAM

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BOX9J7

DATA SHEET

į.	7330 Melissa C. Mannion	Client/Case no Contract	Hanford TRB-SBB-207925	SDG H0704
Lab sample id Dept sample id		Client sample id Location/Matrix		SOLID
	01/06/00		01/04/00 12:30	

analyte	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.503	0.15	0.079	1.0	محر	
Uranium 235	15117-96-1	0.037	0.050	0.095	1.0	U	ט
Uranium 238	U-238	0.473	0.15	0.079	1.0	100	U
Plutonium 238	13981-16-3	0.004	0.022	0.040	1.0	ט	PU
Plutonium 239/240	PU-239/240	O	0:014	0.040	1.0	U	ΡU
Total Strontium	SR-RAD	0.017	0.15	0.19	1.0	U	SR
Potassium 40	13966-00-2	12.0	0.55	0.26			GAM
Cobalt 60	10198-40-0	ប		0.022	0.050	U	GAM
Cesium 137	10045-97-3	0.044	0.025	0.026	0.10	pt 1	GAM
Europium 152	14683-23-9	ט		0.059	0.10	U	MAD
Europium 154	15585-10-1	ซ		0.084	0.10	U	GAM
Europium 155	14391-16-3	ט		0.067	0.10	บ	GAM
Radium 226	13982-63-3	0.451	0.045	0.040	0.10		GAM
Radium 228	15262-20-1	0.683	0.11	0.10	0.20		GAM
Thorium 228	14274-82-9	0.659	0.033	0.028			GAM
Thorium 232	TH-232	0.683	0.11	0.10			GAM
Americium 241	14596-10-2	U		0.072		U	GAM
Uranium 238	U-238	U		2.7		U	GAM
Uranium 235	15117-96-1	υ		0.088		U	GAM

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DATA SHEET

T .	7330 Melissa C. Mannion	Client/Case no Contract	Hanford TRB-SBB-207925	SDG H0704
•		Client sample id Location/Matrix Collected Custody/SAF No	116-D-2 01/04/00 12:00	SOLID 05

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.182	0.077	0.073	1.0	N.	Ū
Uranium 235	15117-96-1	0.009	0.018	0.070	1.0	ับ	U
Uranium 230	Ŭ-23B	0.227	0.078	0.058	1.0	p	U
Plutonium 238	13981-16-3	0.004	0.023	0.043	1.0	ับ	PU
Plutonium 239/240	PU-239/240	0.008	0.015	0.029	1.0	ซ	PU
Total Strontium	SR-RAD	0.044	0.13	0.17	1.0	U	SR
Potassium 40	13966-00-2	3.09	0.50	0.37		_	GAM
Cobalt 60	10198-40-0	ט		0.033	0.050	ט	GAM
Cesium 137	10045-97-3	ט		0.029	0.10	U	GAM
Europium 152	14683-23-9	ช		0.064	0.10	Ü	GAM
Europium 154	15585-10-1	ט		0.12	0.10	Ü	GAM
Europium 155	14391-16-3	ซ		0.055	0.10	Ü	GAM
Radium 226	13982-63-3	0.189	0.049	0.049	0.10	_	GAM
Radium 228	15262-20-1	0.250	0.12	0.13	0.20		GAM
Thorium 228	14274-82-9	0.276	0.033	0.032			GAM
Thorium 232	TH-232	0.250	0.12	0.13			GAM
Americium 241	14596-10-2	ט		0.037		U	GAM
Uranium 238	U-238	U		3.6		ט	GAM
Uranium 235	15117-96-1	ט		0.084		י	GAM

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BOX9KO

DATA SHEET

1	7330 Melissa C. Mannion	Client/Case no Contract	Hanford TRB-SBB-207925	SDG H0704
Lab sample id Dept sample id		Client sample id Location/Matrix		SOLID
· -	01/06/00	· · · · · · · · · · · · · · · · · · ·	01/04/00 13:00	005

ANALYTE	CAS NO	RESULT pCi/g	20 ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.398	0.14	0.093	1.0	m	ט
Uranium 235	15117-96-1	0.012	0.024	0.090	1.0	ับ	U
Uranium 238	U-238	0.466	0.14	0.074	1.0	20	U
Plutonium 238	13981-16-3	0.054	0.081	0.14	1.0	Ū	PU
Plutonium 239/240	PU-239/240	0	0.054	0.11	1.0	U	PU
Total Strontium	SR-RAD	-0.062	0.13	0.17	1.0	Ŭ	SR
Potassium 40	13966-00-2	11.8	0.89	0.51			GAM
Cobalt 60	10198-40-0	Ŭ		0.042	0.050	ซ	GAM
Cesium 137	10045-97-3	ซ		0.046	0.10	บ	GAM
Europium 152	14683-23-9	ប		0.10	0.10	U	GAM
Europium 154	15585-10-1	ט		0.13	0.10	บ	GAM
Europium 155	14391-16-3	U		0.10	0.10	U	GAM
Radium 226	13982-63-3	0.490	0.076	0.078	0.10		GAM
Radium 228	15262-20-1	0.644	0.17	0.18	0.20		GAM
Thorium 228	14274-82-9	0.621	0.047	0.048			GAM
Thorium 232	TH-232	0.644	0.17	0.18			GAM
Americium 241	14596-10-2	U		0.15		U	GAM
Uranium 238	U-238	Ü		4.6		ซ	GAM
Uranium 235	15117-96-1	ט		0.17		ซ	GAM

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BOX9K1

DATA SHEET

1	7330 Melissa C. Mannion	Client/Case no Contract	Hanford TRB-SBB-207925	SDG H0704
Lab sample id		Client sample id		COLTR
Dept sample id Received	01/06/00	Location/Matrix Collected	01/04/00 13:15	SOLID
% solids	94.4	Custody/SAF No		005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.554	0.17	0.076	1.0	15)	ט
Uranium 235	15117-96-1	0.048	0.048	0.092	1.0	ซ	บ
Uranium 238	U-238	0.396	0.12	0.076	1.0	M	U
Plutonium 238	13981-16-3	-0.004	0.007	0.028	1.0	ับ	ΡŲ
Plutonium 239/240	PU-239/240	-0.007	0.007	0.035	1.0	ซ	PU
Total Strontium	SR-RAD	-0.063	0.11	0.15	1.0	ซ	SR
Potassium 40	13966-00-2	13.2	0.81	0.42			GAM
Cobalt 60	10198-40-0	ช		0.039	0.050	ט	MAD
Cesium 137	10045-97-3	ซ		0.036	0.10	U	GAM
Europium 152	14683-23-9	U		0.091	0.10	Ū	GAM
Europium 154	15585-10-1	ซ		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.13	0.10	U	GAM
Radium 226	13982-63-3	0.549	0.080	0.077	0.10		GAM
Radium 228	15262-20-1	0.824	0.16	0.16	0.20		GAM
Thorium 228	14274-82-9	0.769	0.049	0.048			GAM
Thorium 232	TH-232	0.824	0.16	0.16		_	GAM
Americium 241	14596-10-2	Ū		0.32		์ ט	GAM
Uranium 238	U-238	U		4.6		U	GAM
Uranium 235	15117-96-1	ט		0.16		U	GAM

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BOX9K2

DATA SHEET

	7330	Client/Case no	<u>Hanford</u> <u>SDG H0704</u>
	Melissa C. Mannion	Contract	<u>TRB-SBB-207925</u>
į.		Client sample id Location/Matrix Collected Custody/SAF No	116-D-2 SOLID 01/04/00 13:30

ANALYTE	CAS NO	RESULT pCi/g	20 ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233	U-233/234	0.419	0.13	0.065	1.0	15th	υ.
Uranium 235	15117-96-1	0.031	0.042	0.079	1.0	บ	U
Uranium 238	U-238	0.428	0.13	0.065	1.0	187	U
Plutonium 238	13981-16-3	0	0.030	0.060	1.0	บ	PU
Plutonium 239/240	PU-239/240	0.019	0.030	0.050	1.0	U	PU
Total Strontium	SR-RAD	0:018	0.097	0.14	1.0	ט	SR
Potassium 40	13966-00-2	11.6	0.75	0.26			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	σ	GAM
Cesium 137	10045-97-3	0.057	0.026	0.030	0.10	8	GAM
Europium 152	14683-23-9	U	•	0.069	0.10	ט	GAM
Europium 154	15585-10-1	U		0.085	0.10	ប	GAM
Europium 155	14391-16-3	ប		0.062	0.10	ד	GAM
Radium 226	13982-63-3	0.435	0.051	0.045	0.10		GAM
Radium 228	15262-20-1	0.738	0.12	0.12	0.20		GAM
Thorium 228	14274-82-9	0.618	0.034	0.029			GAM
Thorium 232	TH-232	0.738	0.12	0.12			GAM
Americium 241	14596-10-2	U		0.035		Ü	GAM
Uranium 238	U-238	Ū		3.1		U	GAM
Uranium 235	15117-96-1	ซ		0.10		υ	GAM

100 D Areas - Full Protocol

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Laboratory Narrative and Chain-of-Custody Documentation

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1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0704 was composed of six solid (soil) samples designated under SAF No. B99-005 with a Project Designation of: 100 D Areas – Full Protocol.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. Results were transmitted to BHI via facsimile on February 15, 2000.

2.0 ANALYSIS NOTES

2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.2 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.3 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.4 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

Decine Habio	rd Inc.	Į CI	IAIN OF CUST	CODY/S	AMP	LE ANAL	YSIS	REQUEST	Ր	B99	9-005-80	Page 1	01 2
Collector Behnke/Kerkow			ny Contact kow	Telephor 531-06	c No. 35			Project Coordi TRENT, SJ	nator	Price Code	8K		
Project Designation 100 D Areas - Full Protocol			ing Location D-2	0704	(7	330)		SAF No. B99-005		Air Quality		15]	Days
Ice Chest No.	452	Field I	ogbook No. 1339-6				•	Method of Ship	megt)	<u> </u>			
Shipped To Pit TMA/REORA 1-4-00		Offsite	Property No.	QQC	2	183		Bill of Lading	35	495	33	119	
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80X9J9										BOX4LO			192
Вохэко										BOX 4MI			A10
B0X9K1							·			BOLYMS			A (
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				de Mino		٠		•					1
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l	First No. First Included First Inc												
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Decirci Han	iora inc.	[C]	HAIN OF CUST	rody/s	AMPI	Æ ANAL	YSIS	REQUE	ST	B99	9-005-80	Page 2	of <u>2</u>
Collector Behnke/Kerkow			any Contact rkow	Telephor 531-00				Project Coo TRENT, SJ	rdinator	Price Code	8K .		rnaround
Project Designation 100 D Areas - Full Protoc	ol		ling Location -D-2	H0704	(7730)		SAF No. B99-005		Air Quality		15	Days ———
Ice Chest No. SM	452	} EL-	Logbook Na. 1339-6		COA R116D2	22F00		Method of S	hipment AO E	М	<u> </u>		 _
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Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	(c)	D	E
PROJECT:	60D arees)	DATA PACKAGE	: H070'	f
VALIDATOR:	TLL	LAB: TU)	DATE: 3/13	100
CASE:			sog: Ho	704	
		ANALYSES	PERFORMED		
☐ Gross Alpha/Beta	Strontium-90	☐ Technetium-99	Alpha Spectroscopy	Spectroscopy	
☐ Total Uranium	☐ Redium-22	☐ Tritium	a		
SAMPLES/MATE	LPXOZ XIS	6 BOXG	57 Bo	४५७१	
	BGX9	_		962	
	·				
					
	·				Soil
1. Completen	ess				D N/A
Technical ver	rification for	ms present? .		Yes	NO NA
Comments:		•			\mathbf{O}
					
·					
2. Initial C	Calibration .	·····			· · · BENVA
Instruments/d	etectors cali	brated withir	ı	Va	s No N/A
Initial calib		nalysis?	*		
				•	
		• • • • • •			•
Comments:					·
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M 000022

WHC-SD-EN-SPP-001, Rev. 1

3. Continuing Calibration			.\\$	LN/A
Calibration checked within one week of sample analysis? .		Yes	No	N/A
Calibration check acceptable?			No	N/A
Calibration check standards NIST traceable?			No	N/A
Calibration check standards expired?			No	N/A
Comments:		<u></u>	 -	
				
4. Blanks	• •		. [N/A
Method blank analyzed?		(Yes)	No	N/A
Method blank results acceptable?		Yes	No	N/A
Analytes detected in method blank?		_ ~	No	N/A
Field blank(s) analyzed?			No	N/A
Field blank results acceptable?			6 0	N/A
Analytes detected in field blank(s)?			No	N/A
Transcription/Calculation Errors?		Yes	No	N/A
Comments: U234 U238 (espec) K.40 R	<u>. </u>	556/33	8 4	4228)
5. Matrix Spikes			. 1	A/A
Matrix spike analyzed?	• •	. Yes	No `	N/A
Spike recoveries acceptable?			No	N/A
Spike source traceable?		. Yes	No	N/A
.		. Yes	No	N/A
Spike source expired?		V	No	N/A
		. 162		
Transcription/Calculation Errors?	• •	. res		
Spike source expired?		. res	_ -	
Transcription/Calculation Errors?		. res		

WHC-SD-EN-SPP-001, Rev. 1

6. Labora	atory Control S	amples .	•	•		•	•	•	•			•	•	•		•	□ N/A
and the second s	zed?															No No	N/A N/A
	eries acceptabl															No	(N/A)
																No	(N/A)
	tion/Calculatio											٠	•	•	162	МО	
Comments:																	
				_					_		,						
7. Chemic	cal Recovery .	• • • • •	•	•		•	•	•	•			•	•	•	······································	•	—— □ N/A
Chemical (carrier added?									•				?	Yes	No	N/A
	recovery accept													•	_	No	N/A
	carrier traceab													\		No	N/A
	carrier expired															No	(NA)
	tion/Calculatio															No	(N/A)
Comments:																	
				_													
8. Dupli	cates				•		•	•	•	•	•		•	•	···	•	□ N/A
Duplicates	s Analyzed? .		•				•	٠							Yes	No	N/A
RPD Value	s Acceptable?			•			•	•	•	•			•	. (Yes)	No	· .
Transcrip	tion/Calculatio	n Errors?	•	•			•	•			•		•		Yes	No	(N/A)
Comments:			<u> </u>			_											
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9. Field QC Samples	. □ N/A
Field duplicate RPD values acceptable? Yes Field split sample(s) analyzed? Yes Field split RPD values acceptable? Yes	NO N/A NO N/A NO N/A NO N/A
Performance audit sample results acceptable? Yes Comments: BoxiJL / BoxiJ7	No (N/A)
10. Holding Times	
Are sample holding times acceptable?	No N/A
11. Results and Detection Limits (Levels D & E)	. 🗆 N/A
Results supported in raw data? Yes	NO N/A NO N/A NO N/A
Transcription/Calculation errors? Yes MDA's meet required detection limits? Yes	No N/A
Transcription/calculation errors?	NO (N/A)
7235 IN 16 KO KI	

Date:

14 March 2000

To:

Bechtel Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

100-D Areas - Full Protocol - 116-D-2 Pluto Crib

Subject: Inorganics - Data Package No. H0704-RLN (SDG No. H0704)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0704-RLN prepared by RECRA LabNet (RLN). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
вох9Ј6	1/4/00	Soil	С	Chromium VI by 7196A
вох9J7	1/4/00	Soil	С	Chromium VI by 7196A
BOX9J9	1/4/00	Soil	С	Chromium VI by 7196A
вохэко	1/4/00	Soil	С	Chromium VI by 7196A
BOX9K1	1/4/00	Soil	С	Chromium VI by 7196A
вох9к2	1/4/00	Soil	С	Chromium VI by 7196A

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI.

All holding times were acceptable.

Blanks

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable although the TDL was exceeded.

Equipment Blank

One equipment blank (BOX9J9) was submitted for analysis. All equipment blank results were acceptable although the TDL was exceeded.

Accuracy

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

Precision

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 30% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

All laboratory duplicate results were acceptable.

Field Duplicates

One sample duplicate pair (BOX9J6/BOX9J7) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan TDLs or the CRDL if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The TDL was exceeded for all samples. Under the BHI statement of work, no qualification is required.

Completeness

Data package No. H0704-RLN (SDG No. H0704) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The TDL was exceeded for all samples. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, Validation Statement of Work, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, 100 Area Remedial Action Sampling and Analysis Plan, U.S. Department of Energy, May 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.
 The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0704	REVIEWER: TLI	DATE: 3/14/00	PAGE_1_OF_1_
COMMENTS: No qualifiers	assigned		
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
		,	

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HA				4															
Laboratory: RECRA L																			
Case	SDG: HO																		
Sample Number		B0X9J6		BOX9J7		BOX9J9		вохоко		BOX9K1		BOX9K2		1		<u> </u>		<u> </u>	
Location		A9		A9	A9		A10		A1		A2		I		1				
Remarks		·		Duplicate		£. Blank				<u> </u>				Г					
Sample Date		1/4/00		1/4/00		1/4/00		1/4/00		1/4/00		1/4/00				I			
Inorganica	CRDL.										a		a	Result	<u>a</u>	Result	Q	Result	Q
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Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/17/00

CLIENT: TNU-HANFORD B99-005

RECRA LOT #: 0001L161

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	PACTOR							
							-001	BOX9J6	♦ Solide	94.8	•	0.01	1.0
									Chromium VI	0.42 u	MG/KG	0.42	1.0
-002	BOX9J7	* Solids	93.5	•	0.01	1.0							
		Chromium VI	0.43 u	MG/KG	, 0.43	1.0							
-003	вохэлэ	t Solida	100	•	0.01	1.0							
		Chromium VI	0.40 u	MG/KG	0.40	1.0							
					4 °								
-004	BOX9KO	* Solids	94.8	•	0.01	1.0							
		Chromium VI	0.42 u	MG/KG	0.42	1.0							
-005	BOX9K1	• Solide	94.2	•	0.01	1.0							
		Chromium VI	0.42 u	MG/KG	0.42	1.0							
-006	BOX9K2	% Solids	96.0	•	0.01	1.0							
		Chromium VI	. 0.42 u	MG/KG	0.42	1.0							

12/00 3/13/00

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-005

RFW#: 0001L161 SDG#: H0704 SAF#: B99-005 W.O. #: 10985-001-001-0

Date Received: 01-06-00

FEB 2000

FEB 2000

RECEIVED

Data

Log In

INORGANIC CASE NARRATIVE

- 1. This narrative covers the analyses of 6 soil samples.
- 2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.
- 3. Sample holding times as required by the method and/or contract were met.
- 4. The cooler temperature was recorded on the chain-of-custody.
- 5. The method blank for Chromium VI was within method criteria.
- 6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
- 7. The matrix spike recoveries were within the 75-125% control limits.
- 8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
- 9. Results for solid samples are reported on a dry weight basis.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

Date

njp\i01-161

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 12 pages.

BehnkerKerkow Rickrow States of Stat	Bechtel Hanford Inc. CHAIN OF CUSTODY/SAM				MPL	TI DE TITUE DE REQUEST					Page 2	of <u>2</u>		
Tide Lapban No. Fiel Lapban No	Collector Behnke/Kerkow	•								dinetor	Price Code	8K		
INSPIRED A TO THANKERA THE HAZARDS/REMARKS PROEstill Franchister No. of Container P of J No.	Project Designation 100 D Areas - Full Protocol										Air Quality	<i>-</i>	15	Days T
Preservation Type of Container No. of Continer(s) Volume It. Some It. S		99:627	EL-	1339-6		R116D2	2F00				K		; _	
Preservation Type of Container No. of Continer(s) Volume It. Some It. S		<u> </u>	Offsite	Property No.	98:	2			Bill of Ladia		1 223	310	8	
Special Handling and/or Storage Type of Container No. of Containe	POSSIBLE SAMPLE HAZA	ARDS/REMARKS			1 1									
Secretal Handling and/or Storage No. of Container(s) Volume IL Some	•			Type of Container	P	•G	1			 				1
Sample No. Matrix * Sample Date Sample Time Social I - 4 - 0 D (33.0 X B) CHAIN OF FOSSESSION Sign/Frist Names CHAIN OF FOSSESSION Sign/Frist Names Impairable By Date/Time Committee Commit				No. of Container(s)	1	ı								
SAMPLE ANALYSIS Secretary Sample No. Matrix * Sample Date Sample Time Sample No. Sample Date Sample Time Sample No. Sample No. Sample Date Sample No. Sample Date Sample No. Samp	Special Handling and/or Sto	rage	Ì	Volume	IL	60mL	1							
Sample No. Matrix * Sample Date Sample Time Sample No. Matrix * Sample Date Sample Time	SAMPLE ANALYSIS				Special								<u>.</u>	
OXBIZ Soil 1-4-00 1330 X Bott 1849	<u>•</u>										TIETO			<u> </u>
CHAIN OF POSSESSION Sign/Print Names Insquished By B K LA Date/Time (# 3 a Beceived By Date/Time CHAIN OF POSSESSION Sign/Print Names SPECIAL INSTRUCTIONS (1) Gamens Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155): Botopic Phatonium; Strontium-89,90 — Total St Total By Date/Time Received By Date/Time		Matrix *	<u> </u>	Sample Time										
CHAIN OF POSSESSION Sign/Print Names Date/Time 3 0 Date/Time		Soil	1-4-00	1330	 	<u> </u>	-			-	BOXYMS	 		-
CHAIN OF POSSESSION Sign/Print Names Inequished By RB KLA Date/Time 30 All SAMPLE Disposal Method Sign/Print Names SpeCIAL INSTRUCTIONS (1) Gameta Spectroacopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); SpeCial Instructions (1) Gameta Spectroacopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Special Instructions (1) Gameta Spectroacopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Special Instructions (1) Gameta Spectroacopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Special Instructions (1) Gameta Spectroacopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Special Instructions (1) Gameta Spectroacopy (Cesium-137, Cobalt-60, Europium-155); Special Instructions (2) Date/Time Special Instructions (3) Date/Time Special Instructions (4) Gameta Spectroacopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Special Instructions (5) Date/Time Special Instructions (6) Gameta Spectroacopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Special Instructions (6) Date/Time Special Instructions (7) Gameta Spectroacopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Special Instructions (8) Date/Time Special Instructions (9) Date/Time Date/Time Date/Time Date/Time Date/Time Date/Time Date/Time Date/Time							-		-					
CHAIN OF POSSESSION Sign/Print Names Inequished By RS Kark By Date/Time (2.3 o B) Date/Time (3.3 o B) D				-			+			+				
Inquished By REKAN Date/Time 30 Received By Date/Time 153 Received By Date/Time 154 Europium-154 Europium-155 Europiu	<u> </u>										 	 		
28 KERLON 81-04-05 REF 1B 01-04-06 Sinquished By Date/Time Received By Date/Time Received By Date/Time Received By Date/Time FECCEX 1-000 Date/Time Received By Date/Time Received By Date/Time Received By Date/Time Date/Time Received By Date/Time Date/Time Received By Date/Time Date/Time Received By Date/Time Date/Time Date/Time Date/Time Date/Time Date/Time Date/Time Date/Time Date/Time			Sign/Print				CIAL INSTR	UCTIO	NS			<u> </u>		Matrix *
The state of the s	RB KERKOW	01-04-00	RECUIB	01-0	4-00		Gemma Spectro pic Plutonium;	scopy (Ce Isotopic U	sium-137, Cobeli Iranium; Strontius	-60, Europi: n-89,90 — T	um-1 52, Europium otal Sr	-154, Europium	-155);	SR-Sedment SO-Solid
Duto/Time Duto/Time	$KCY \rightarrow K \rightarrow K$	5.00 184 3 5 1	$TK \cdot I \cdot Nov$	en 1.5.00	0/090	2								W = Water O=CM A=Altr
FECEX 1-(200 0920 Throw 1/000 0920 Inquished By Date/Time Received By Date/Time Date/Time Received By Date/Time Date/Ti	Moren	5.00/1430	FED'	EX	te/Time	4								T=Tienet
linquished By Dute/Time Received By Dute/Time ABORATORY SECTION Disposal Method Disposal Method Received By Dute/Time Disposal Method Disposal Method Disposal Method														L=Liquid V=Vegetadon
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NAL SAMPLE Disposal Method Disposed By Date/Time		•	l <u> </u>		Title		<u>, </u>					Dat	te/Time	
	INAL SAMPLE Disposal Me	thod					Dispo	sed By				Da	te/Time	· .

Bechtel Hanford Inc. CHAIN OF CUSTODY/SAM				AMPI	E ANA	LYSIS	IPLE ANALYSIS REQUEST B99-0					Page	of <u>2</u>	
Collector Behnke/Kerkow			ny Contact kow	Telepho 531-0				Projec TREN	t Coordi∎a Γ, SJ	for	Price Code	8K		rnaround
Project Designation 100 D Areas - Full Protoco	<u>.</u>		ing Location D-2					SAF N B99-0			Air Quality		15	Days ———
Ice Chest No. ERC	.9902	Field I	ogbook No. 4-00		COA R116D	22F00		Metho	d of Shipm					
Shipped To TMA/RECRA	1		Property No.	008	2			Bill of	Lading/Ai	r Bül N	1953	3 319	38	
POSSIBLE SAMPLE HAZ	ZARDS/REMARKS		Preservation	None	Cool 46		E.							
			Type of Container	P	≱G									
			No. of Container(s)	ı	1									
Special Handling and/or St	iorage		Volume	IL	60mL									
00015	SAMPLE ANALY	ysis		See item (1) is Special Instructions.	Chromiss Hex - 719						TIET			
Sample No.	Matrix *	Sample Date	Sample Time						اکس	منابید				
B0X9J6	Soil	1-4-00	1230		X						Box4LD			
B0X9J7	Soil	1-4-00	1230		K						BOXYLO			
B0X9J9	Soil	1-4-00	1200		L K		_	-			BOX4LO			
B0X9K0	Soil	1-4-00	1300		<u> </u>						BOKYMI			
B0X9K1	Soil :	1-4-00		<u> </u>	<u> </u>						BOXYMS			Matrix *
CHAIN OF POSSESSI Relinquished By RB Kute RB KERKOW Belinquished By Relinquished By Relinquished By Relinquished By Relinquished By Relinquished By	Date/Time/630 01-04-00 Date/Time SDO/0900 I.SDO/0400 Date/Time/1/30 Date/Time Date/Time	Received By	KKIThory YEN 1.5.1 Delta Co	te/Time/6.3 4-00 te/Time te/Time te/Time	(I) iso	ECIAL INST	Irancapy (C	esium-13	7, Cobelt-60, Strontium-89,	Europius 90 — Tol	n-152, Europium tal Sr		-155); 1e/Time	S-fail SC-Sadiment SC-Sadid S -Shelps W - Walar C-OH A-Alr DS-Dream Sadids DL-Dream Liquids T-Tlams WI-Wips L-Liquid X-Vegstales X-Other
SECTION						D'-	posed By				······································	Di	ste/Time	
FINAL SAMPLE Disposal DISPOSITION	Method						tones nà				<u></u>			

Appendix 5

Data Validation Supporting Documentation

WHC-SD-EN-SPP-002, Rev. 2

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	(c)	D	E
PROJECT:	OOD ween		DATA PACKAGE	: H0704	
VALIDATOR:	TU	LAB: Reco		DATE: 3/13/	
CASE:			sog: Ho	704	
		ANALYSES	PERFORMED		
CLP/ICP	☐ CLP/GFAA	D CLP/Mg	CLP/Cyanida	٥	0
□ \$W-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	SW-846 Cyanida	X CRUI	0
SAMPLES/MATE	IIX BOX9J	6 Box	957 B	7X9J9	
	BOX 9		· · · · · · · · · · · · · · · · · · ·	0×91<2	
·					
					
					
					Sail
				 	
Is technical	verification rative preser	documentation	present? .		Yes No N/A
2. HOLDING T	IMES	, ,			
		cceptable? .		· · · · · · · · · · · · · · · · · · ·	Yes No N/A
			<u></u>	<u> </u>	
			<u> </u>		·
					
					
					
					

M 000017

WHC-SD-EN-SPP-002, Rev. 2

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS	\sim
Were initial calibrations performed on all instruments? Yes	No N/A
Are initial calibrations acceptable? Yes	No N/A
Are ICP interference checks acceptable? Yes	No N/A
Were ICV and CCV checks performed on all instruments? Yes	No N/A
Are ICV and CCV checks acceptable? Yes	No N/A
Comments:	
1	
4. BLANKS	
Were ICB and CCB checks performed for all applicable analyses? Yes	No ATOX
Are ICB and CCB results acceptable? Yes	No (N/A)
Were preparation blanks analyzed? Yes	No N/A
Are preparation blank results acceptable?	No N/A
Were field/trip blanks analyzed? Yes	No N/A
Are field/trip blank results acceptable? Yes	No N/A
Comments:	
5. ACCURACY	
Were spike samples analyzed? Yes	No N/A
Are spike sample recoveries acceptable? Yes	No N/A
Were laboratory control samples (LCS) analyzed? Yes	No N/A
Are LCS recoveries acceptable? Yes	No (N/A)
Comments:	

WHC-SD-EN-SPP-002, Rev. 2

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION	(
Were laboratory duplicates analyzed?	· Yes	No	N/A
Are laboratory duplicate samples RPD values acceptable?	Yes.	No	N/A
Were ICP serial dilution samples analyzed?	. Yes	No	(NLA)
Are ICP serial dilution %D values acceptable?	. Yes	No	W
Are field duplicate RPD values acceptable?	. (Yes)	Ng	N/A
Are field split RPD values acceptable?		100	(N/A)
Comments:			
7. FURNACE AA QUALITY CONTROL			
Were duplicate injections performed as required?	. Yes	No	/ N/A \
Are duplicate injection %RSD values acceptable?	. Yes	No	N/A
Were analytical spikes performed as required?	. Yes	No	N/A
Are analytical spike recoveries acceptable?	. Yes	No	N/A
Was MSA performed as required?	. Yes	No	N/A
Are MSA results acceptable?	. Yes	No	\N/A/
Comments:			
		_:	
8. REPORTED RESULTS AND DETECTION LIMITS			·
Are results reported for all requested analyses?	. Yes	No	N/A
Are all results supported in the raw data?	. Yes	No	
Are results calculated properly?	. Yes	No!	N/A
Do results meet the CRDLs?	. Yes	Ng	N/A
Comments: all our			
	<u></u>		
			

M 000019

[T	T -	
		 	
		Da	ta validation results:
Validator:	DWS	T	
Date:	3/22/2000		
Project:	100D full proto	col	
SAF	B99-005	T	
SDGs:	. HO-704	116-D-2	
	HO-706	116-D-4	
	HO-672	1607-D-2	
data package	analysis	page	comment
3#	radchem	NA-	why same result for both Re228 and Th 232 for all samples?
ــــــــــــــــــــــــــــــــــــــ	radchem	NA	CRDL for Cc137 on DOE/RL-96-22 is 0.05 on lab data shets the
			RDL is listed as 0.1
W	radohom	NA	GROL for Pu238-8-Pu239/240 on DOE/RL-96-22 is 0.1 on lab data
· .			shets the RDL is listed as 1.0
10-704	radchem	2 & 3	B0X9J7 is listed as an equipment blank on page 0002 and as a
10-24		3	duplicate on page 0003 Under "detection levels" the analysis "Uranium-239 (gea)" is called
10-704	radchem		out should be Uranium 238
10-704	 	4	Under "minor deficiencies" again the analyte U239 is called out
0.706	radchem	4	Under "detection levels" the following samples were reported above
			their TDLs: Uranium 233/234 B0X9K8 and B0X9L6
Q-706	radchem	4	"minor deficiencies" should be corrected to reflect the U233/234-
0-706	radchem	10	Sample B0X9K8 is flagged with a "U" qualifier, however the result is
			greated than the MDA. Cr-/37
0-672	radchem		Discrepancy between requested Sr-90 (DOE/RL 96-2) and reported
111			total Sr result. If Sr total is the correct analysis then all refrences to
	1		Sr90 (pages 3, 4, and 9) should be corrected. If Sr total is the
			correct analysis, then the units on lab results (pages 23 through 29)
			should be corrected if not pCi/g

RLW 3/22/00 RLW 3/22/00 RLW 3/22/00

2/23/00 pr

RIW 3/2400 PZ 3/22/00

RIW 3/2400 PZ 3/22/00

V-1.deti-n report should
refor to "Total Radioactive
strontium" in =11 instances

of "5-70" = "Strontium"
total"

PLW 3/260°

HO-672	radchem	4	Under "detection levels" the following samples and analyses did not meet the CRDL: U235 (gea) should be changed to also except B0T6R3; Eu154 failed on B0W409 and B0W410; Eu152 failed on B0W409 and B0W403, B0W409 through B0W413; Co60 failed on B0W409 through B0W412; Ra228 failed on B0T6N8, B0T6N9, B0W403, B0W409 through B0W413; Ga137 failed on B0W403, B0W409 through B0W413.	- limit is 0.1, result is 0.098 no change per 3/23/00 RLW 3/22/00
HO-672	radchem	5	Under "minor deficiencies" the list of samples which failed the CRDL requirements should be changed to reflect the above additions.	No conselle requel
HO-672	radchem	11	Summarized results for Co60 on sample B0W410 are listed as 3.5 pCi/g whereas on the lab report page (page 26) the result is reported as 3.52 pCi/g	carrest 1/2 3/23/00

•

			
<u> </u>		 	
		Data	a validation results:
Validator:	DWS	<u> </u>	
Date:	3/22/2000		
Project:	100D full protoco	ıl .	
SAF	B99-005		
SDGs:	HO-704	116-D-2	
	HO-706	116-D-4	
	HO-672	1607-D-2	
data package	analysis	page	comment
HO-704	Cr+6		inconsistent use of PQL and TDL 61
H0-706	Cr+6		no comments
10-672	Cr+6/ICP/CVAA	3	inconsistent use of PQL and TDL
	Semi-voa	3	Under Precision, sample B0T6R1 listed as "B0TR1" 61
	Semi-voa	4 8 12	Sample B0T6N4 is flagged with a "J" and a result of 25ug/Kg even
		_	though the typical MDL-is 330.—If this is a real value then "minor deficiencies" and "analytical detection levels" need to be corrected
•	}		to include 80T6N4 as also not exceeding the GRDL
			
	-		
	 		
	<u> </u>	l	

Per 3/23/00

corrected New 3/2/00
RLW 3/22/00

VALIDATION REVIEW - MARCH 16, 2000 - RL WEISS

SDG H0706 (Inorganics & Radiochemistry): No comments.

SDG H0704 (Inorgnics & Radiochemistry): No comments.

SDG H0672 -Radiochemistry: No comments.

Semivolatiles: "Analytical Detection Levels"; Need to insert boilerplate referencing

TDLs to 100 Area SAP. "Minor Deficiencies"; Change "CRQL" to

Inorganics:

"Equipment Blank"; Change "PQL", "TDL". Carro Kz

Area SAP has no SV info So I usual

previously submitted No days. Par 3/23/00

			
		 	
		Da	ta validation results:
Validator:	DWS	1	
Date:	3/22/2000)	
Project:	100D full proto	col	
SAF	B99-005		
SDGs:	. HO-704	116-D-2	
	HO-706	116-D-4	
	HO-672	1607-D-2	
data package	analysis	page	comment
all	- radehem-	NA	why same result for both Ra228 and Th 232 for all samples?
all	radchem	NA.	CRDL for Cc137 on DOE/RL-96-22 is 0.05 on lab data shets the
			RDL is listed as 0.1
all	radehem	NA -	CRDL for Pu238 & Pu239/249 on DOE/RL-96-22 is 0:1 on lab data
·			shets-the RDL is listed as 1.0
HO-704	radchem	2 & 3	B0X9J7 is listed as an equipment blank on page 0002 and as a
HO-704	radchem	3	duplicate on page 0003 Under "detection levels" the analysis "Uranium-239 (gea)" is called out should be Uranium 238
HO-704		4	Under "minor deficiencies" again the analyte U239 is called out
HO-706	radehem	-4	Under "detection levels" the following samples were reported above their TDLs: Uranium 233/234 B0X9K8 and B0X9L6
10.700	radchem		"minor deficiencies" should be corrected to reflect the U233/234
10-706	radchem	10	Sample B0X9K8 is flagged with a "U" qualifier, however the result is
10-706	racciem	i U	
			greated than the MDA. Cr-/37
10-672 #//	radchem	many	Discrepancy between requested Sr-90 (DOE/RL 96-2) and reported total Sr result. If Sr total is the correct analysis then all refrences to Sr90 (pages 3, 4, and 9) should be corrected. If Sr total is the correct analysis, then the units on lab results (pages 23 through 29) should be corrected if not pCi/g

RLW 3/22/00 RLW 3/22/00

RLW 3/24/00

RLW 3122/00

RLW 3/24/00

Validation report should refor to "Idel Radioactive Strontium" in all instances of "5-70" or "Strontiam" total"

RLW 3/12/p

HO-672	radchem	4	Under "detection levels" the following samples and analyses did not meet the CRDL: U235 (gea) should be changes to also except B0T6R3; Eu154 feiled on B0W409 and B0W410; Eu152 feiled on B0W403, B0W409 through B0W413; Co60 feiled on B0W409 through B0W412; Re228 feiled on B0T6N8, B0T6N9, B0W403, B0W409 through B0W413; Re226 feiled on B0W403, B0W409 through B0W413; Ce137 feiled on B0W403, B0W409 through B0W413.
HO-672	radchem	5	Under "minor deficiencies" the list of samples which failed the CRDL requirements should be changed to reflect the above additions.
HO-672	radchem	11	Summarized results for Co60 on sample B0W410 are listed as 3.5 pCi/g whereas on the lab report page (page 26) the result is reported as 3.52 pCi/g

RLW 3/22/00

	<u>, </u>	
		· · · · · · · · · · · · · · · · · · ·
	Data	validation results:
DWS	Dau	Yandadon regulas,
_	.]	
	116-D-2	
	116-D-4	
HO-672	1607-D-2	
analysis	page	comment
Cr+6		inconsistent use of PQL and TDL
Cr+6		no comments
101.0		
Cr+6/ICP/CVAA	3	inconsistent use of PQL and TDL
Semi-voa	3	Under Precision, sample B0T6R1 listed as "B0TR1"
Semi-voa	4 & 12	Sample B0T6N4 is flagged with a "J" and a result of 25ug/Kg even
		though the typical MDL is 330. If this is a real value then "minor
		deficiencies" and "analytical detection levels" need to be corrected
	_	to include 80T6N4 as also not exceeding the CRDL
	100D full protoco B99-005 HO-704 HO-706 HO-672 analysis Cr+6 Cr+6	3/22/2000 100D full protocol B99-005 HO-704 116-D-2 HO-706 116-D-4 HO-672 1607-D-2 analysis page Cr+6 Cr+6 Cr+6 Cr+6/ICP/CVAA 3 Semi-voa 3

RZW 3/22/00

	Review Com		 Date 3/21/00 	2. Review No. BHI/QA0021					
					3. Project 100-D	4	Page 1 of 1		
5. Do	5. Document Number(s)/Title(s) 6. Program/Project/ Building Number			<u> </u>	8. Organization/Group		9. Location/Phone		
SDG No. H0704		100-D Areas – Full Protocol – 116-D-2	Claude Sta	cey	BHI/QA		Н0-16/372-92	/372-9208	
17. Co	mment Submittal Approval:	10. Agreement with indicated of	comment dispositi	on(s)	11. CLOSED				
Organization Manager (Optional)		Date Rev	iewer/Point of Co	ntact	Date	Rev	iewer/Point of Contac	ext	
		Aut	hor/Originator	1		Aut	hor/Originator	,	
12. Item	13. Comment(s)/Discrepancy(s) (Procomment and detailed recommendates resolve the discrepancy/problem incommendates)	tion of the action required to correct/	14. Hold Point	15. Dispos	ition (Provide justification	if NOT acce	pted.)	16. Status	
1	Radiochemistry: OK No comments								
2	Inorganics: OK No Comments				-				
3									
	-	:							

)uncan, Jeanette M

rom: Sent: Routt, Tina/RLO [troutt@ch2m.com] Thursday, March 16, 2000 12:05 PM

Γο: Cc: Duncan, Jeanette/RLO-HAN Weiss, Richard/RLO-HAN

Subject:

FW: Review of Validation (116-D-4, 116-D-9, 1607-D2_P, 116-DR-1&2, 116-D-2)

Jeanette -

Both of my comments are incorrect. I had a typo in 116-D-2, cobalt is fine. Also per a discussion with Rich, the 56% in 116-D-9 is also correct as written in draft validation report.

Thanks,

Tina

> ----Original Message---> From: Routt, Tina/RLO
> Sent: March 15, 2000 10:20 AM
> To: Duncan, Jeanette/RLO-HAN
> Co: Miller, Rex/RLO-HAN; Callison, Stacey/RLO-HAN; Ivey, Lyle/HAN
> Subject: Review of Validation (116-D-4, 116-D-9, 1607-D2_P,
> 116-DR-1&2, 116-D-2)
>
> Jeanette > I've looked at the draft validation reports for sites 116-D-4, 116-D-9,
> 1607-D2_P, 116-DR-1&2, 116-D-2. They look good. I only have a couple of
> comments.
> 116-D-9 (H0706) Radiochemistry: Add to Precision section - U-238 has an
> RPD of 56% in B0X9L4.
> 116-D-2 (H0704) Radiochemistry: Add to Detection Levels section - Co-60
> in B0X9J9 also has MDA>TDL.
> Tina Routt
> CH2M Hill Richland Office
> troutt@ch2m.com
> (509) 375-3444, ext. 211
> (509) 375-5566 fax

Duncan, Jeanette M

From:

Routt, Tina/RLO [troutt@ch2m.com] Wednesday, March 15, 2000 10:20 AM Duncan, Jeanette/RLO-HAN

Sent: To:

C¢:

Miller, Rex/RLO-HAN; Callison, Stacey/RLO-HAN; Ivey, Lyle/HAN

Subject:

Review of Validation (116-D-4, 116-D-9, 1607-D2_P, 116-DR-1&2, 11 6-D-2)

Jeanette -

I've looked at the draft validation reports for sites 116-D-4, 116-D-9, 1607-D2_P, 116-DR-1&2, 116-D-2. They look good. I only have a couple of comments.

116-D-9 (H0706) Radiochemistry: Add to Precision section - U-238 has an RPD of 56% in B0X9L4. 116-D-2 (H0704) Radiochemistry: Add to Detection Levels section - Co-60 in B0X9J9 also has MDA>TDL.

Tina Routt CH2M Hill Richland Office troutt@ch2m.com (509) 375-3444, ext. 211 (509) 375-5566 fax

VALIDATION REVIEW - MARCH 16, 2000 - RL WEISS

SDG H0706 (Inorganics & Radiochemistry): No comments.

SDG H0704 (Inorgnics & Radiochemistry): No comments.

SDG H0672 -Radiochemistry: No comments.

Semivolatiles: "Analytical Detection Levels"; Need to insert boilerplate referencing TDLs to 100 Area SAP. "Minor Deficiencies"; Change "CRQL" to

"TDL".

"Equipment Blank"; Change "PQL", "TDL". Inorganics: